Weekly Report for 01/26/2015

Highlights

• Carried out standard SCU0 startup measurements. Chamber alignment is okay and cryogenic performance is good. (Kathy Harkay)

• Tested synrad3d code from Cornell, in preparation of benchmarking with CERN Synrad code for APSU. (Kathy Harkay)

APS Renewal and Upgrade

• Prepared and gave presentation for Machine Advisory Committee titled "Tolerances, Correction, and Stability". Participated in the MAC review. (Vadim Sajaev)

• Arranged for installation of synrad3d, the Cornell 3D synchrotron photon tracking code. Tested code using sample files, in consultation with L. Boon. Found a memory issue; following up. (Kathy Harkay)

• Attended MAC meeting. (Kathy Harkay)

• Prepare talk for APS-U MAC review. (Yipeng Sun)

• Attend and present a talk for APS-U MAC review. (Yipeng Sun)

• I spent much of the last two weeks preparing for and then attending the MAC review. I did one extra dry run, and then presented my talk on collective effects. I also attended most other talks, and tried to add comments/answer questions when necessary. (Ryan Lindberg)

MCR Operations

Storage Ring Operations

• Participated in SR start-up. Studied ID4 aperture limitation. Together with other studies, found that ID4 aperture is smaller than before. Set up user lattice for 24 singlets mode. (Vadim Sajaev)

• Modified topup monitoring software that uses S38A bpms to record and plot bpm sum signals to study injection efficiency. (Vadim Sajaev)

• Prepared instructions for Operators to monitor SCU0 cryogenic performance (LHe tank pressure) during topup checkout, in consultation with Y. Ivanyushenkov and K. Schroeder. (Kathy Harkay)

• Communicated with ID6 user issues relating to SCU0 state program. Discussed with all parties involved, plan to reboot IOC and test next machine intervention (2/10). (Kathy Harkay)

Linac Operations

• Participated in meeting to discuss replacement of RG1 with new gun due to the fact that water flow through RG1 (Gen II, MG300) is restricted and causing instability in gun operations. (Jeff Dooling)

• Previously, the gun last power-tested in the ITS would be installed; however, N. Sereno decided to follow S. Pasky's suggestion of installing the 3G3 gun which was undergoing tests in the vacuum lab and had not yet been power cycled. (Jeff Dooling)

• The gun in the ITS 3G1 had been power cycled. (Jeff Dooling)

• With Yine Sun, completed low-level rf measurements of thermionic cathode gun 3G3 in the vacuum lab. (Jeff Dooling)

• Collected samples of corrosion in the 3G3 water lines prior to giving the gun back to the Vacuum group to prep for installation in RG1. (Jeff Dooling)

APS Machine Studies

Storage Ring Studies

• Measured SCU0 vertical chamber alignment and confirmed that it is within 100 microns of the most reacent measurement prior to warmup/cooldown over the Dec/Jan shutdown (Sep 2014). Measurement should be repeated after S7A:P1 offsets are remeasured (snubbers). (Kathy Harkay)

• Checked the SCU0 skew quadrupole feedforward compensation and found that the existing table gives x-y emittance ratio change less than 0.05% over the full range of coil current 0-700 A. (Kathy Harkay)

• Monitored progress for SCU0 cryocooler performance (400, 500, 650 A) during topup checkout. (Kathy Harkay)

• IK1 kicker calibration studies using FPGA turn histories. Shifted the timing to get maximum amplitude for bunch 0. (Kathy Harkay)

• Presented summary of studies results at weekly machine studies meeting. (Kathy Harkay)

• Acquired ID1 BLM data for IK1 at different kick amplitudes. Results are somewhat similar to last time, where the kick was constant and we shifted the bunch posiition, but the signal level is very small (with J. Dooling). (Kathy Harkay)

• Tune scan for lifetime. (Yipeng Sun)

APS Machine Research and Development

Storage Ring Research and Development

• Tested newly installed fast BLMs in ID1. Both upstream and downstream monitors are functioning. (Jeff Dooling)

• Conducted a study with K. Harkay to try to calibrate the new ID1 fast BLMs; however, could not obtain good single-turn loss. (Jeff Dooling)

• Sent R. Lindberg beam loss arrival time data to compare with impedance simulation. (Jeff Dooling)

• At the request of L. Emery, worked with A. Brill (ASD-DIA) to install a spare Cerenkov detector (CD) in ID4 for injection loss monitoring. (Jeff Dooling)

• The CD output goes directly to a scope on the mezzanine to provide fast signal response. (Jeff Dooling)

• Analyzed IK1 kicker calibration data from machine studies. (Kathy Harkay)

• Processed abort kicker waveforms from J. Wang in preparation for elegant analysis. These all are based on a single-turn coil but with different decay times. (Kathy Harkay)

Linac Research and Development

• Installed new splitter, aligned optics, and took profile and energy measurements on the pcgun laser optics table in the linac tunnel. (Jeff Dooling)

• Using the Coherent LaserCam HR in CW mode, was able to capture uv images for comparison with the VC. (Jeff Dooling)

• Worked with S. Shoaf (AES-CTL) to update laser optics control screen. (Jeff Dooling)

• Uploaded McCrone Associated report on pcgun laser residue testing to ICMS. The report is APS_1675847. (Jeff Dooling)

Other Research and Development

• Completed a simple and fast code to compute the angular and spatial distributions of the undulator field from a single electron. I then shared the code with colleagues in XSD for potential use in the code SHADOW. (Ryan Lindberg)

APS Machine Software

Storage Ring

• wrote ExperimentDesigner configurations for Yipeng Sun for his tune measurement and lifetime scan application, wrote getSRtune script to be used in ExperimentDesigner to monitor the SR x/y tune during experiment scan. Fixed the bug of changing knob pvs, tested and installed ExperimentDesigner. (Hairong Shang)

• wrote holVCPosition scrip for Diag group to turn the heater and hold VS position, ready for test. (Hairong Shang)

• Tested P0FBScan with CY, finished mixer delay and sample delay scan, and added post-processing to them. This is to automate the P0Feedback parameter setup. (Hairong Shang)

• Improved FPGABpmTurnHistory : corrected the logic error in checking outpput file existence, and added catch statement to "exec sdds2stream -rows=bar $file" to be able to continue waiting for files being generated and avoided reading the file if it does not exit yet. (Hairong Shang)

Injectors

• added B5C8 booster FPGA bpm to MpBpmWaveformViewer and SBPMWaveform configuration. (Hairong Shang)

• improved BRampControlAutoCorrection: added checking if the gain setpoint and readback agrees before generating IRamp reference, and added setting the gain setpoint to 1.0 and delay setpoint to 0 after IRamp reference is generated. (Hairong Shang)

• added SetupCorrectors button to setup/initialize booster correctors before scan to Booster4CorrectorBumpScan (Hairong Shang)

General

• added SCU0 Coupling Feedforward to routine operations menu. (Hairong Shang)

• Improved ExperimentDesigner: 1) fixed a bug in setup knob config file for individual knob and uncommented knob restore to be able to change knob pv values. 2) removed the extra quotes of units in saving configuration which broke the SDDS file format. (Hairong Shang)

Publications, papers and report

• Updated figures and text in response to referee comments on SCU0 paper. (Kathy Harkay)

• Started working on Abort Kicker technical note. (Kathy Harkay)

Meetings, workshops, conferences, committees, LMS related, and reviews

• Attend and present a talk for APS-U MAC review. (Yipeng Sun)

Education, Mentoring and outreach

• Wrote recommendation letter for A. Vella (undergrad student, summer 2013 and Jan 2014). (Kathy Harkay)

• Helped prepare Joseph Calvey's research proposal for the Director's Postdoc Application, and then wrote and submitted a nomination memo on his behalf. (Ryan Lindberg)

Safety and Required Training

• Reviewed eJHQ. (Kathy Harkay)